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ABSTRACT

The construction of a category-type observational instrument based on sets of similar behavioral components from mutually exclusive subsets of measurably stated objectives of a particular special education treatment program is described. Systematic Who-to-Whom Analysis Notation is an in-process instrument employed unobtrusively, utilizing a who-to-whom format and the three-second rule. The observational data are reported to teachers and supervisors in meaningful forms and are used to supplement teachers' impressions and other clinical judgments in the evaluation of progress and in the subsequent modification of the treatment for each child participating in the Rutland Center program. (Author)

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An Observational Instrument Based On the Objectives of a Special Education Curriculum[1]

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Observational instruments have been devised to meet the measurement needs in a variety of situations. A classification scheme for observational instruments based in part on parameters specified by Simon and Boyer (1972), Medley and Mitzel (1963), and Prall (1959) is presented in Figure 1.

Insert Figure 1 about Here

The major purpose of an observational instrument is the measurement of specific overt behaviors of particular subjects in selected settings according to an established format. Thus, one must specify appropriate parameters to determine the limits of his situation in order to choose an observational instrument suitable for his measurement purpose(s). As is often the case, an instrument which meets the measurement demands of a given situation is not always available. Then, assuming an instrument is not available, one must construct an instrument based on the determined parameters at hand or forgo measurement by observational instrument means.

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Parameters for Consideration

A brief review of the scheme as detailed in Figure 1 is needed to clarify the basis on which an instrument can be chosen or constructed. The order in which these parameters is considered is arbitrary, but in general this order appears to be appropriate for observational instrument selection or construction.

The first parameter is the instrument's frame of reference. Is one interested in some part of the affective, cognitive, psychomotor, sociological, behavioral domains, or some combination thereof? For example, is one concerned with measuring some specific mathmatical skills or concerned with who is talking with whom in a classroom? An observational instrument must be based on some frame of reference for meaningfully relating the observational results to a specified referent or set of referents. A particular key to observational instrument construction is the availability of measurably stated objectives based on the chosen frame of reference. Without some objectives based on the frame of reference one has extreme difficulty in choosing or constructing the instrument much less meaningfully relating the data collected to specified referents.

The second parameter is use of the observational data. Are the data to be used for research or hypothesis testing purposes in the formal sense, for formative or summative evaluation purposes, for training teachers, or for some combination of the above in order to provide data for some decision-making procedure.

The third and fourth parameters, respectively, are the setting in which the observational data are to be collected and the type of observational system to be employed. The settings may be classroom, industrial, experimental, or some other situation. This parameter is

closely allied to the frame of reference, the use of the data, and to the type of observational system to be employed. What type of observational system should one use? Should one use a narrative type of observational system in which a verbal description or story of what is occuring is collected; a diary or anecdotal type in which only selected events, positive, negative, or both are recorded; a complete transcript in which one receives a transcript of exactly what has occurred; a sign system in which one records the frequency of particular behaviors; a rating scale system in which one looks at behaviors for a certain period of time and rates those behaviors on a series of dimensions; a category system in which one records behaviors in broader categories each of which is composed of groups of signs or behaviors; or possibly some combination of the above types of observational instruments? (For further information on this parameter, see Medley and Mitzel, 1963.)

The fifth parameter concerns the role the observers are to play and the number of observers needed. Is the observer to be a participant (or a non-participant) and record data in a very unobtrusive manner, or is the observer to remain unseen and record data? Are there more than one observers needed to collect the data or to watch two or more persons simultaneously?

Sixth, what type of coding unit is to be used with the type of observation chosen? Particular examples of coding units are recording speaker change (one person stops talking and another begins), category change (a person or group do something different such as talking and then working), topic change (a person or group changes from English to Math), time unit (a mark is recorded periodically indicating what

a person or group is doing), audience change (record when one talks to different subgroups within one group), language change (English to French, or question-answering to lecturing), or question-answer-response (record only behaviors dealing with questions, then answers, and then responses as during a conversation between two individuals or during a debate.)

The seventh parameter is the sample of behavior to be observed. Should one look only at one sample of behavior per subject or group; should one look at repeated samples, and if so should these samples be random and/or periodic, or planned and/or periodic? Additionally, should the samples be random, periodic and taken for only a part of an activity? Should one look at only one particular activity or a series of activities? This consideration is related particularly to the use of the information and the constraints which this places on the data. Additionally, this relates to the frame of reference for an indication of the theoretical constraint of determining when one needs to observe which relates to the other parameters previously reviewed.

The eighth parameter should be decided only after the prior seven have been discussed or determined. Examples of types of data recording are a fixed form such as recording on a sheet of paper, a moving tape akin to the tape output of an EEG, a direct punching to cards such as with a computer card punch machine, recording on video or audio tape and later transcribing, or coding in process. Each of these may be performed based on an individual, a group, or some combination thereof.

The ninth parameter is reporting the results of the observational data to particular recipients. The data should be readily interpretable and meaningful to the audience to whom the information is presented. Supervisors might need different information or a different format as compared to classroom teachers, for instance.

The tenth parameter is determining the method of assessing the instrument's reliability. A variety of methods is available but the user should be aware of the functioning and limitation(s) of a particular index prior to employing it in his situation. Examples of indices available are the contingency coefficient, percent agreement, Bernstein's (1967) coefficient and Scott's (1954) pi.

Each of these ten parameters must be specified prior to searching the literature for an instrument or the subsequent construction of an observational instrument.

Systematic Who-to-Whom Analysis Notation

Determination of Parameters

The frame of reference for the observational instrument sought is Developmental Therapy (Wood, 1972), which is a therapeutic psycho-educational curriculum for emotionally disturbed children. This frame of reference is composed of four curriculum areas: behavior, communication, socialization, and academics. It was decided that for the purposes of this observational instrument, emphasis should be restricted to behavior, communication, and socialization, as academics could be measured by the children's production during their academic time.

Secondly, the data are for formative and summative evaluation for therapeutic programs. These data would constitute one input into making programatic decisions. The third and fourth parameters concern the setting in which the observational data are collected and the type of observational system employed. The setting is a classroom situation removed from a regular school building, and the type of observation employed was determined to be a category system. A category system is composed of categories consisting of similar groups of overt behaviors or groups of signs. The advantage of using the category type of observation in this situation was its objectivity -- two different individuals look at the same behavior and record such behavior in the same category. Bales states that categories should be mutually exclusive and independent of all other categories (Bales, 1951). One can thus obtain a reasonable degree of interobserver agreement, which is one method of indicating reliability or accuracy. The data obtained through the use of this instrument are used in conjunction with other data in the evaluation of a therapeutic program.

The fifth parameter is the number of observers and the role the observers are to play in the observation. This parameter was determined by the availability of an observation room with one-way mirrors for each classroom. This allowed for a non-participating, unseen observer to unobtrusively observe. Additionally, this allowed for a sampling plan without the constraints of entering and leaving a classroom, a potential problem when observing emotionally disturbed children.

It was decided that a time unit (sixth parameter) of three seconds could be used in this situation and that a one minute observation per child would be employed. This provided 20 bits of information per one-minute observation and allowed for structured training of observers.

The seventh parameter concerns the sample of behavior to be observed. Each of the classes at the center has approximately eight children who attend four days per week. At the time of the construction of this instrument there were approximately ten classes per day. Considering the work load of the observers (evaluators), it was determined that each class could be observed once per week. The day on which each class would be observed would be randomly selected and a schedule was completed prior to the beginning of each ten week treatment session to guarantee randomness (table of random numbers). Thus, each class would be observed once a week during each of ten weeks of a treatment program. Each of the activity periods for the classes lasted no longer than fifteen minutes as determined by a week of spot checks on the duration of activity times. With eight children per class and activity periods only fifteen minutes in maximum duration it was determined that one minute was an appropriate sample of behavior. The order in which the children are to be observed during any one activity period would be randomized. Thus, there would be randomization in the day of observation and the time of observation during any one activity period. Additionally, it was determined that four activity periods would be observed for each class. Thus, an observer would observe each of eight children in each of four activity periods during one day per week for each of the ten classes in the

center. It was also determined that two activities would be observed for every class; this would allow for some comparison between various classes. The other two activities to be observed would be either the choice of the therapists concerned with the class or on a random basis on the part of the observers (evaluators). Also, the same activities would be observed for any class for any one ten-week period of observation. This allowed for some summative evaluation at the end of a ten-week treatment period.

The type of recording data (the eighth parameter) was determined to be who-to-whom as it was important to note the interaction between children. (Each treatment program is planned for the individual and then carried out in a group situation; thus, information relating to individual children was required.) Additionally, the data were to be recorded on fixed form and coded in-process.

Ninth, the data were to be reported to teachers, supervisors, and other administrators.

For the tenth parameter, it was decided that an interobserver percent agreement of no less than 75% would be necessary for any observer to collect data.

Thus, the parameters are fixed as indicated in Figure 2. With this information, one could now look for an observational instrument which satisfied the demands of the parameters. The literature was searched and only one instrument was found which was partially concerned with the objectives as determined by the frame of reference. The variables on which that instrument was based were not delineated to the degree needed for the objectives, and the usage of the categories required more judgment than was deemed desirable for this measurement

situation. Then, it was determined that the construction of an observational instrument to satisfy the parameters as previously described and depicted in Figure 2 was necessary.

Insert Figure 2 about Here

Instrument and Construction

Certain prior stated parameters as depicted in Figure 2 guided the construction of this observational instrument. First, measurably stated objectives based on the treatment program were available. This allowed for the construction of the observational instrument based on sets of similar behavioral components of mutually exclusive subsets of the measurably stated objectives of Developmental Therapy (Wood, 1972). As many objectives as possible were to be measured, but as the observers were to record in-process, the author was encouraged to create as few categories as possible for observers to memorize and use. And, as the data were to be reported to teachers and supervisors, the data necessarily had to be in a format meaningful to them.

Systematic Who-to-Whom Analysis Notation provides four ways to measure a specific objective: a particular behavior category, the duration of a particular behavior category occurring, the activity in which a behavior occurs and the who-to-whom Format. A particular behavior category is defined with specific referents obtained from the measurably stated components of the objectives. The duration of be-

havior is indicated by a continous recurrence of a particular category. The activity is obviously determined. And the who-to-whom aspect of recording the behavior in the column of the person to whom such behavior is directed, distinguishes between self, teacher, child, and group or materials. Those objectives most readily measured behaviorally were chosen for measurement by the instrument.

The objectives were grouped both according to similarity of overt measurable behavioral components of the objectives and so as to maximize the total number of objectives measured by the instrument. Additional categories, not based on particular objectives and primarily allowing for the recording of inappropriate behavior, were added to enable the observational data to more completely depict a child's behavior. A series of drafts of the instrument were prepared and piloted for varying periods of time by three original observers. After each pilot testing, the instrument was refined, capitalizing on the strengths and minimizing the limitations of the previous instrument. Modifications were made and piloting was re-initiated. The result is Systematic Who-to-Whom Analysis Notation, composed of eight major and sixteen minor categories (Figure 3).

Insert Figure 3 about Here

The method in which each of the objectives are measured by the instrument (category, duration, activity, who-to-whom) is depicted in Figure 4. An "X" in a column indicates that the objective is

measured by that particular method. In some cases, more than one column contains an "X"; this indicates that the objective is measured by the particular combination of categories.

Insert Figure 4 about Here

Protocol Rules

A result of the pilot testing was the realization that certain protocol, or encoding, rules needed to be specified. The first such rule concerns the who-to-whom format usage. The observer records the child's behavior according to whom it is directed (toward himself, the teacher, another child, or the group or materials). For instance, if a child looks at, or talks to, the teacher, the symbol representing such behavior is recorded in the teacher's column. However, if the child is engaged in independent play, the proper symbol is recorded in the child's column. Such a procedure provides information relating to the frequency and type of interactions the child has with those individuals and groups in his environment. If the observer is in doubt as to whom a behavior was directed, he records the proper symbol in the Group-Materials column.

The inappropriate categories have priority in being recorded over any other categories. (Any time an inappropriate category is recorded, a statement in the "comment" section is required stating what

such behavior was.) This rule was adopted because one of the general aims of the program is the reduction of such behavior. Verbal behavior categories have priority over physical behavior categories, when both verbal and physical behavior occur simultaneously, because verbal behavior is considered to be a more sophisticated level of behavior. The only exception to this rule occurs when the physical behavior is inappropriate.

When a child follows directions, an "F" is recorded for only one three-second interval even though the same general activity continues. After such recording, some other category is recorded, depending on what the child does in completing the directions. This rule was determined because it is extremely difficult for the observer to decide when a child has completed the directions he was to follow. Some arbitrary decision was in order, and the rule was accepted.

Category "O" is recorded in the who-to-whom format in a particular child's column when, and only when, the child is looking at himself in a mirror in an appropriate manner. This rule was adopted only because of the need to measure the objective on which it is based.

A final protocol rule states that all minor categories have priority in the order listed under the major categories. For example, Inappropriate physical activity is recorded before Parallel play or Play if any occur simultaneously. Such orders were determined primarily by judgment provided by various members of the professional staff.

Data Collection and Presentation to Recipients

It was determined that one unseen observer (observing in an observation room) using a three-second time coding unit for a one-minute observation of each child during each of four activity periods once per week would be used. The one-minute samples of behavior are recorded on the who-to-whom observation sheet (a fixed form).

Each one-minute sample of behavior is summarized by recording the percent of time spent per category. This is recorded on the Who-to-Whom observation sheet as indicated in Figure 5. Additionally, the percent of time spent per category is recorded on the Summary (last page of Figure 5). This latter summary allows one to compare changes of behavior over specified time periods. Figure 5 provides two examples of observation for a particular child during Play time for two weeks. These two weeks are then summarized over time on the Summary.

Insert Figure 5 about Here

The data collected and summarized as per the example in Figure 5 are presented to teaching teams and administrators within one-half hour of the completion of the team's class. Each of the teachers and administrators has received training in the interpretation of the observational data. The observer remains available to discuss in detail the observational data should there be any questions concerning it.

The programatic changes determined by the input of the observational data and all other relevant information to the decision process are clearly the province and responsibility of the respective teaching teams and appropriate administrators.

Reliability

Percent agreement was chosen as the index to assess the observers' accuracy in using the instrument.[3] This allowed for the comparison of the results of a criterion observer (the author) with other results of other observers to determine the degree to which the results were similar, or the degree of agreement.

Video tapes were prepared containing a series of one-minute samples of children's behavior obtained by viewing classrooms at Rutland Center. A criterion observation was made by the author for each of the one-minute samples of behavior, and this observation sheet was used as the criterion for other observers observing the tapes. A specific observer was given an introduction to the instrument and the mechanics of the observing, and then the viewing of the video tapes commenced. Each observer repeated the viewing of the tapes until he had achieved a minimum of 75% agreement with the criterion (mastery of the tapes). This was conducted for all tapes. This approach was employed for determining accuracy as opposed to a single criterion tape due to the fact that a single or some small number of tapes simply could not provide examples of all the categories and employ the variety of situations which an observer might be expected to observe. This procedure employed more realistically approaches

mastery of the observational system.

Table 1 provides information on the achievement of accuracy for the three original observers on the video tapes. The ranges and medians are based on all viewings of the video-tapes from initial training to achievement of minimal level of accuracy (75% agreement).

Insert Table 1 about Here

Limitations

The observational instrument measures 39 of the 85 measurably stated objectives of Developmental Therapy (Wood, 1972). Many of the unmeasured objectives could be measured if a content analysis dimension were added to the instrument. For instance, one unmeasured objective states "to produce a recognizable word to obtain a desired response from an adult." By some content analysis one might determine what such a "desired response" might be. Thus, additional observer judgment would be employed to measure more objectives. Another objective relates to the child's description of one's own feelings such as happy, sad, or fearful. Content analysis might provide an avenue for measuring this objective.

A second limitation concerns the training and utilization of qualified observers. The observer training program requires approximately two days of constant effort per group of observers (no more

than four observers per group). Following training, the observers can usually observe only two classes of eight children per day -- classes last approximately one and one-half hours and contain from four to eight activities each -- due to fatigue. This indicates the need for one observer per ten classes per week at the maximum, and two observations per day require approximately four hours total time per day, including time for summarizing results. Thus, there must be other tasks for an observer to perform if hired full time. Also, the observers need retraining approximately every six months to maintain reliability. Based on training 17 observers since January 1, 1972, an observer need have no more than a high school education and one year of some other type of training, varied though it may be.

A third limitation is the application of the instrument to measurement situations other than Developmental Therapy as the instrument is content valid only for this special education curriculum. If one reviews the parameters described previously in this paper and determines that this instrument is content valid for his situation then the instrument would be useful. Otherwise, use of the instrument is not warranted. Many of the parameters could be altered to meet the measurement demands of a situation, but the frame of reference should remain the same, i.e., examining these behaviors.

A fourth limitation is the use of the data collected. Since January, 1972, it has been noted that different teaching teams and administrators use the observational data to greatly varying degrees. Such use appears to be a function of the teams respective training rather than the usefulness of the application of the information.

This was anticipated prior to construction of the instrument and the program evaluation plan of which this instrument is one part. Thus, these data are not and were not planned to be, the sole evaluative measure of the treatment program. All of the users of the data indicate that the information they received was an important input in the evaluation of the individualized program for each child and was often used as an indication of the necessity for many types of programatic modifications.

Summary

Systematic Who-to-Whom Analysis Notation was constructed, subsequent to the establishment of appropriate parameters, based on the overt behavioral components of a set of behaviorally stated objectives. The observational instrument has been utilized in five different centers of the Georgia Psychoeducational Center Network, the first being Rutland Center where the instrument was developed. Seventeen observers have been trained and observational data have been collected on approximately 400 children attending the centers for severely emotionally disturbed and/or behaviorally disordered children. The users of the data collected have indicated that such information is an important input for decisions concerning curriculum and programatic change.

FOOTNOTES

1. The instrument was constructed and the data collected in part through a special project grant from the U. S. Office of Education, Bureau of Education for the Handicapped, under the Children's Early Education Assistance Act, P. O. 91-230, Part C, formerly 90-538.

2. Dr. Carl Huberty is acknowledged for his careful reading of an earlier draft of this manuscript.

3. For further information on accuracy indices (based on data gathered with this instrument) see Swan, W. W. Four indices for investigating inter-observer agreement of observational instruments. Paper presented at AERA Annual Meeting with joint NCME session, New Orleans, 1973.

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FIGURE 1

Classification Scheme for Observational Instruments

Parameters	Examples
1. Frame of Reference	: Affect, cognition, psychomotor, activity, procedure or routine content, sociological structure, physical environment
2. Use of Data	: Research, training, evaluation, decision-making
3. Setting	: Classroom, non-classroom, industrial, research
4. Type of Observational System	: Narrative, diary, anecdotal, complete transcript, sign, rating scale, category
5. Observer(s)	: Participant, non-participant, unseen, number of observers
6. Coding Unit	: Category change, speaker change, topic change, audience change, language change, question-answer response, time unit
7. Sampling of Behavior	: Constant or periodic time sampling, single observation, particular activities or times
8. Type of Data Recording	: Fixed form, moving tape, direct punching, video tape, audio tape, in-process; group, who-to-whom
9. Recipient(s) of Results	: Supervisor, teacher, pupil, evaluator, administrator
10. Method of Determining Reliability	: Contingency coefficient, percent agreement, Bernstein's coefficient, Scott's pi.

FIGURE 2

Parameters Determined For This Measurement Situation

1. Frame of Reference	: Developmental Therapy-curriculum areas of behavior, communication, and socialization
2. Use of Data	: Formative and summative evaluation
3. Setting	: Classroom
4. Type of Observational System	: Category
5. Observers	: One unseen nonparticipating observer
6. Coding Unit	: Three-second time unit
7. Sampling of Behavior	: Each child observed, in random order once per week during each of the four activity periods
8. Type of Data Recording	: In process on fixed form in who-to-whom format
9. Recipients of Results	: Teachers, supervisors, administrators
10. Method of Determining Reliability	: Percent agreement

FIGURE 3

Systematic Who-to-Whom Analysis Notation

1. OBSERVES: When a child looks at someone (who is not talking) or something in the classroom, category "O" is recorded.

   In response to child's name being called: When the child observes someone who has just spoken his name, category "ON" is recorded.

   While talking: When a child is looking at another person while that person is talking, category "OT" is recorded.

2. PHYSICAL CONTACT: When a child initiates physical contact such as tapping another on the shoulder, patting another on the back, placing an arm around the shoulder of another, holding hands with another, sitting in another's lap or any similar physical contact, category "C" is recorded.

   Inappropriate: When a child hits, slaps, kicks, knocks, grabs, pushes, or pinches another or some similar physical contact, category "C-" is recorded.

   Restraint: When a child must be physically restrained or physically moved by the teacher, category "--" is recorded in the teacher's who-to-whom column.

   Receives: When a child receives appropriate physical contact, category "CR" is recorded.

   Receives inappropriate: When a child receives inappropriate contact, the category "CR-" is recorded.

3. FOLLOWS DIRECTIONS: When a child conforms (motor behavior) to instructions given by the teacher and when such conforming is not the result of being physically moved, (above, "Restraint"), category "F" is recorded.

   Does not follow directions: When a child does not follow directions to conform, category "F-" is recorded.

4. WORKS: When a child works on something during any structured, individual activity time such as "work time", art time", "organized game time", looks at the story book during "story time", or eats and drinks during "snack time", category "W" is recorded.

   Works, but not appropriately sitting: When a child is doing work but is not appropriately sitting, category "W-" is recorded.

Figure 3
(continued)

5. VERBALIZES: When a child initiates talk with a peer, teacher, or group, or is engaged in conversation with a peer or teacher, or group, and such language is understandable, category "V" is recorded.

   Inappropriate: When a child screams, yells, uses obscene language, or is generally boisterous, or any similar behavior, or when any verbalization is indicated to be inappropriate by the teacher, category "V-" is recorded.

   Non-understandable verbalization: When a child verbalizes and such verbalization cannot be understood by the recorder and there are no teacher cues to indicate that such talk was understandable, (This includes humming when such humming is not inappropriate) category "VN" is recorded.

   I-statements: When a child uses a first person singular pronoun, i.e., I, my, mine, or me, category "VI" is recorded.

   Group-Rules: When a child verbalizes concerning group rules, category "VG" is recorded.

   In response: When a child verbalizes in response to a stimulus, such as when the teacher asks the child a question, and such stimulus is noted by the observer, category "VR" is recorded.

6. PHYSICAL ACTIVITY: When a child walks from one part of the room to another, moves a chair, or any similar physical (motor) behavior, category "A" is recorded.

   Inappropriate: When a child knocks over a chair, lies on the floor when he is supposed to be sitting at the table, throws an object in a classroom, or some similar behavior, category "A-" is recorded.

   Parallel Play: When a child plays in the same, or a parallel, activity as a peer simultaneously, and does not interact in any way with this peer, category "P+" is recorded.

   Play: When a child is participating in an activity, or with materials, with another child or children, or by himself, and such play is not classified as parallel play, category "P" is recorded.

   Responding activity: When a child nods his head or "hunches" his shoulders, or some similar physical activity, while another is talking to him or in response to a question from another category "RA" is recorded.

Figure 3
(continued)

7. NON-DIRECTED ACTIVITY: When a child exhibits unusual, bizarre, or otherwise indescribable physical behavior such as types of rocking, clapping, or withdrawn behavior, such as sitting in a corner by one's self during free time, or thumbsucking, nose-picking, or some similar behavior, category "N" is recorded.

8. REMOVAL FROM VIEW:

   By self: "/"

   By teacher: "//"

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																										DURATION	ACTIVITY	WHO-TO-WHOM
	O	ON	OT	C	C-	--	CR	CR-	F	F-	W	W-	V	V-	VN	VI	VG	VR	A	A-	P+	P	RA	N	/	//			
BEHAVIOR																													
1. to be aware of sensations and to attend to environmental stimuli (through looking directly at object or person in situations using tactile, kinesthetic, visual, auditory, gustatory, and olfactory modalities) (B-1)	X	X	X																										
2. to attend to environmental stimuli (through continued looking at object, person, and sounds after initial stimulus-response has occurred; through sustained sitting in chair during required activity time) (B-2)	X		X								X	X															X	X	
3. to respond with motor behavior to single environmental stimulus: object, person, sound (child gives correct motor or verbal response to the command, "Give me...." No choices offered) (B-3)									X														X						
4. to respond independently to play materials (Age appropriate play not necessary) (B-7)																					X	X					X		
5. to participate in playtime, mat time, games, music, art time, activities with appropriate body movements without physical intervention																													

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																									DURATION	ACTIVITY	WHO-TO-WHOM
	O	ON	OT	C	C-	--	CR	CR-	F	F-	W	W-	V	V-	VN	VI	VG	VK	A	A-	P+	P	RA	N	/	//			
Behavior continued: by teacher for an entire activity time (verbal support may be used) (B-8)											X	X	X								X	X	X			X	X	X	
6. to participate in worktime, story time, talking time, juice and cookie time with uninterrupted sitting during required periods (without physical intervention by teacher; verbal support may be used) (B-9)											X	X															X	X	
7. to use play materials appropriately, simulating normal play experience (B-10)																					X	X						X	
8. to contribute to making group rules of conduct and procedures (B-13)																	X												
9. to verbally recall group rules and procedure (B-16)																	X												
10. to verbalize consequences if group's rules are broken (B-15)																	X												
11. to verbalize simple reasons for group's rules (verbal cues from teacher may be used) (B-16)																	X	X											X
12. to maintain self-control and comply with group procedures (given classroom structure and verbal support by teacher) (B-19)					X	X			X	X	X			X						X			X			X			
13. to spontaneously participate in activities previously avoided (without teacher structure) (B-23)									X			X		X			X	X			X	X					X	X	X

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																										DURATION	ACTIVITY	WHO-TO-WHOM
	O	ON	OT	C	C-	--	CR	CR-	F	F-	W	W-	V	V-	VN	VI	VG	VR	A	A-	P+	P	RA	N	/	//			
COMMUNICATION																													
1. to attend to person speaking (Child looks directly at adult when adult initiates verbal stimulus not necessarily eye contact) (C-1)		X	X																										
2. to respond to verbal stimulus with a motor behavior (Following a command, child points to answer, or makes a choice) (C-2)									X														X						X
3. to discriminatively respond to verbal stimulus with a recognizable approximation of the appropriate verbal response (Child gives correct answer to question, "What is this?") (C-3)															X			X											X
4. to voluntarily initiate a recognizable verbal approximation to obtain a specific object, activity, person (Child produces recognizable approximation spontaneously) (C-4)													X		X														
5. to exhibit a beginning emergence of self (indicated by age approximate human figure drawing; use of personal pronoun I, me, my, or looking at self in mirror) (C-7)	X															X													X
6. to answer a child's or adult's request with recognizable, meaningful words (C-11)																		X									X		X
7. to use words spontaneously to exchange information with an adult (C-13)			X													X	X	X									X		X

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																												DURATION	ACTIVITY	WHO-TO-WHOM
	0	ON	OT	C	C-	--	CR	CR-	F	F-	W	W-	V	V-	VN	VI	VG	VR	A	A-	P+	P	RA	N	/	//				
Communication continued:																															
8. to use words spontaneously to exchange information with another child (minimal verbal spontaneity with information content; requests or demands not applicable)(C-14)			X										x			X	X	X										X		X
9. to contribute a making group rules of conduct and procedure (C-19)																	X														
10. to verbally recall group rules and procedure (C-20)																	X	X													
11. to verbalize consequences if group's rules are broken (C-21)																	X	X													
12. to verbalize simple reasons for group's rules (verbal cues from teacher may be used)(C-22)																	X	X													

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																										DURATION	ACTIVITY	WHO-TO-WHOM
	O	ON	OT	C	C-	--	CR	CR-	F	F-	M	M-	V	V-	VN	VI	VG	VR	A	A-	P+	P	RA	N	/	//			
SOCIALIZATION																													
1. to be aware of adult (Child looks at adult when adult speaks directly to child or touches him) (S-1)	X		X				X																						X
2. to attend to adult's behavior (Child looks at adult when adult is not focussing on child's directly) (S-2)	X		X																								X		X
3. to respond to adult when child's name is called (Child looks at adult) (S-3)		X																											X
4. to respond to adult's verbally initiated request to conform (Child follows adult's verbal directions with correct physical movement) (S-4)									X										X				X						X
5. to respond to adult's verbal and nonverbal requests to come to him (Child moves next to adult and looks at him; and child accepts adult's touch) (S-5)	X						X		X										X				X						X
6. to seek contact with adult spontaneously (Child moves next to adult and touches him) (S-6)				X																									X
7. to engage independently in organized solitary play (S-9)																						X						X	X
8. to exhibit a beginning emergence of self (indicated by age approximate human figure drawing; use of personal pronoun, I, me, my or looking at self in mirror) (S-10)																X													X

FIGURE 4

Objectives and Category Instrument

Measurement Correspondence

OBJECTIVES	CATEGORIES																										DURATION	ACTIVITY	WHO-TO-WHOM
	O	ON	OT	C	C-	--	CR	CR-	F	F-	W	W-	V	V-	VN	VI	VG	VR	A	A-	P+	P	RA	N	/	//			
Socialization continued:																													
9. to participate spontaneously in specific parallel activities with another child using similar materials but not interacting (S-12)																					X						X		X
10. to participate in cooperative activities with another child during playtime, indoor, or outdoor (S-14)																						X						X	X
11. to participate in cooperative activities with another child during organized class activities (S-15)																						X						X	X
12. to participate without inappropriate response in activity suggested by another child (S-21)											X		X					X				X							X
13. to indicate developing friendship by preference for a particular child or children (S-22)																											X		X
14. to spontaneously participate in activities previously avoided (without teacher structure) (S-27)											X										X	X						X	X

FIGURE 5

Example of Who-to-Whom Observation Sheets and Summary

CHILD'S NAME SIDNEY DATE 3/30/12 OBSERVER SUAN

ACTIVITY: Work (Play) Snack Story Recreation Special Game Art

	Teacher	GP/MAT	Sidney	Ina	Youra	Hera	Hea	Shea	Hima	Itsa
1		O								
2	OT									
3	OT									
4							P+			
5							P+			
6						OT				
7						C-				
8								OT		
9								C-		
10	--									
11	--									
12	OT									
13	OT									
14		P+								
15		P+								
16		V								
17		V								
18									P	
19									P	
20									P	

O: 5%	--: 10%	W:	VI:	P+ 20%	COMMENTS:
ON:	CR:	W-:	VG:	P: 15%	C- = hitting
OT: 30%	CR-:	V: 10%	VR:	RA:	
C:	F:	V-:	A:	N:	--- = holding
C-: 10%	F-:	VN:	A-:	/:	
				//:	

FIGURE 5
(Continued)

CHILD'S NAME: Sidney DATE: 5/30/72 OBSERVER: SWAN

Activity: Work (Play) Snack Story Recreation Special Game Art

	Teacher	GP/Mat	Sidney	Ina	Youra	Hera	Hea	Shea	Hima	Itsa
1							P			
2							P			
3							V			
4							OT			
5							VR			
6							P			
7							P			
8						OT				
9								OT		
10						OT				
11	O									
12	O									
13		O								
14							P			
15							P			
16							P			
17							VI			
18							P			
19							P			
20							P			

O: 15 --: ____ W: ____ VI: 5 P+: ____
ON: ____ CR: ____ W-: ____ VG: ____ P: 50
OT: 20 CR-: ____ V: 15 VR: 5 RA: ____
C: ____ F: ____ V-: ____ A: ____ N: ____
C-: ____ F-: ____ VN: ____ A-: ____ /: ____
//: ____

COMMENTS:

Figure 5 (continued)

SUMMARY (1/4/72)
Child's Name: SIDNEY WIDLUNK
ACTIVITY: play

3/30/72	T, G, Hera, Hca, Dea, Hi,
5/5/72	T, G, Hera, Hca, Sea

1. Observes "O"

   Inresponse to child's name being called "ON"

   While talking "OT"

2. Physical contact "C"

   Inappropriate "C-"

   Restraint "--"

   Receives "CR"

   Receives inappropriate "CR-"

3. Follows directions "F"

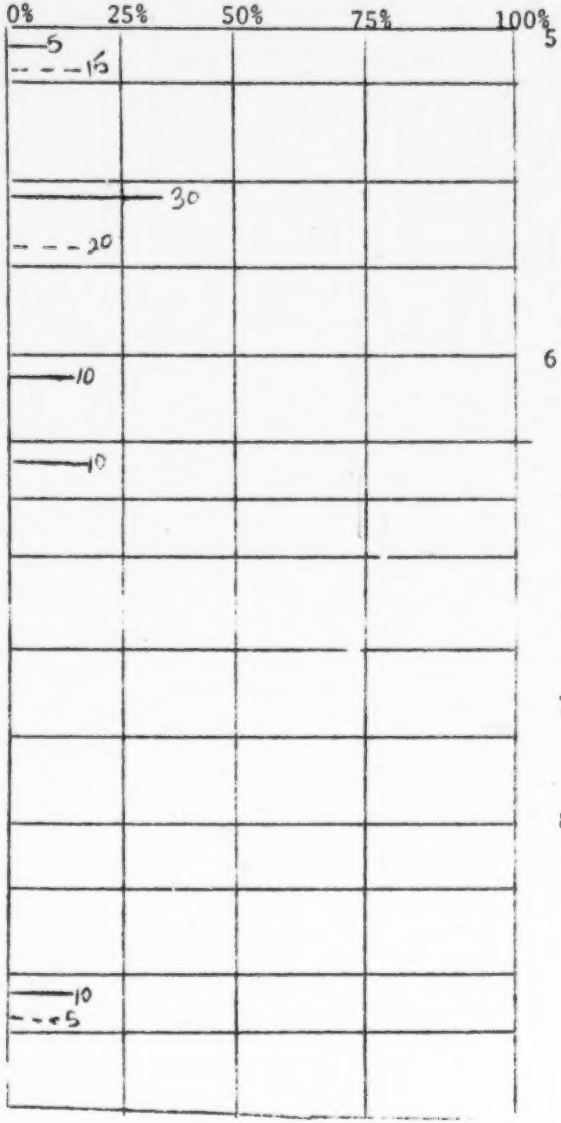
   Does not follow directions "F-"

4. Works "W"

   Working, but not sitting "W-"

5. Verbalizes "V"

   Inappropriate "V-"



5. (cont)
   Non-understandable "VN"

   "I" statements "VI"

   Group rules "VG"

   In response "VR"

6. Physical Activity "A"

   Inappropriate "A-"

   Parallel Play "P+"

   Play "P"

   Responding Activity "RA"

7. Non-directed physical activity "N"

8. Removal from view by self "/"

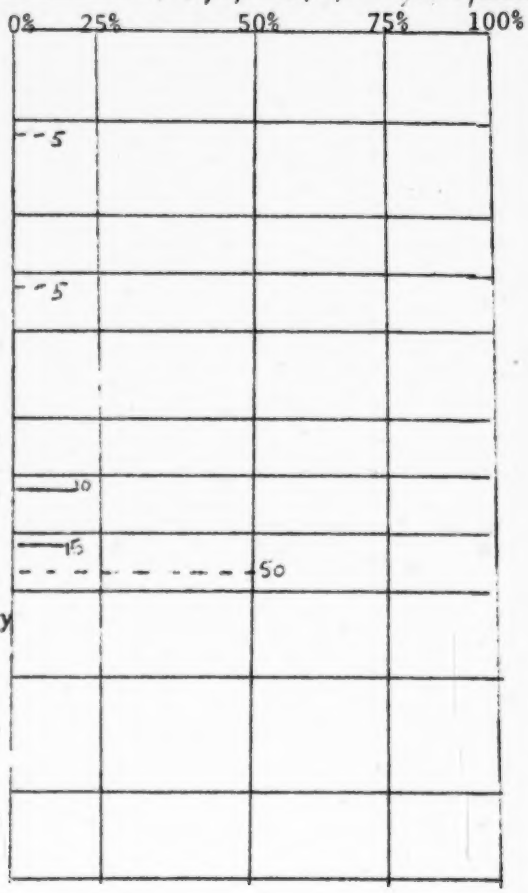


TABLE 1

Percent Agreement Coefficients for Three Observers

	E*	C*
Range	50%-95%	60%-95%
Median	80%	83%

*

E = Exact correspondence -- same category at same time in same who-to-whom column equals agreement.

C = Category-time correspondence -- same category at same time equals agreement.